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ABSTRACT

A project was conducted to obtain information about the effectiveness of the cooperative vocational education method through an examination of evaluations conducted in other states and an analysis of data gathered in South Carolina. The evaluations conducted in other states (reviewed through the literature) provide evidence to support the conclusion that participation in cooperative education programs can provide many benefits to vocational students, such as less employment, faster location of full-time employment after graduation, obtaining jobs related to their field of study, feeling job satisfaction, faster wage increases, higher ratings from employers, and a positive attitude about the cooperative program. Evidence has also been found to indicate that employers who participate in cooperative programs feel that the method is helpful and that participation is beneficial to the participating business as well as to the students. The one effectiveness outcome measured for South Carolina (ratings by employers), gathered from existing data, did not indicate that the participating students received significantly higher employer ratings than did the non-cooperative program students. The ratings for both groups were high, however, and the indication from the South Carolina data is that the cooperative programs and the regular vocational programs are doing an excellent job of training students. It was recommended that cooperative programs include factors which were identified as promoting success; namely, having coordinators who are well trained and competent in relations with employers, having maximum integration of classwork and on-the-job training, securing high quality training stations, having active and involved advisory committees, and hiring coordinators on a ten-month basis. (KC)

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The Effectiveness of
Cooperative Education

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TABLE OF CONTENTS

LIST OF TABLES	i
SECTION I - NATURE OF THE STUDY.	1
Introduction.	1
Background for the Study.	2
Objectives of the Study	2
Delimitations of the Study.	3
Format of the Report.	4
SECTION II - REVIEW OF RELATED LITERATURE.	5
Career Development of Graduates	6
Employer Ratings of Job Performance	11
Attitudes Toward the Cooperative Program.	12
Cost Effectiveness.	13
Success Components.	15
Coordinators	15
High quality work stations	16
Maximum integration of classroom and on-the-job training	17
Advisory committees.	18
Advantages and Disadvantages.	18
SECTION III - EFFECTIVENESS OF COOPERATION IN SOUTH CAROLINA	21
Methods and Procedures.	21

SECTION IV - FINDINGS.	25
Data Analysis	25
Summary of Findings	25
Description of groups.	26
Employer ratings	26
Average Ratings.	30
T-Test Analysis.	30
SECTION V - CONCLUSIONS AND RECOMMENDATIONS.	33
APPENDIX A	
Copy of Survey Form	39
APPENDIX B	
Recommended Reading	43
BIBLIOGRAPHY	45

LIST OF TABLES

TABLE 1 . .	CORRELATIONS BETWEEN STUDENT CHARACTERISTICS AND EMPLOYER RATINGS	23
TABLE 2 . .	RACE, SEX, LENGTH OF EMPLOYMENT, AND SPECIAL STUDENT STATUS, BY GROUP	26
TABLE 3 . .	EMPLOYER RATINGS OF JOB PERFORMANCE, BY GROUP.	27
TABLE 4 . .	RESPONSES TO QUESTION: "AS A RESULT OF THIS PERSON'S VOCATIONAL TRAINING, HOW WOULD YOU RATE HIS OR HER PREPARATION IN RELATION TO OTHER BEGINNING EMPLOYEES WHO DID NOT RECEIVE SUCH TRAINING?", BY GROUP.	29
TABLE 5 . .	MEAN EMPLOYER RATINGS OF JOB PERFORMANCE, BY GROUP.	31
TABLE 6 . .	T-VALUES AND PROBABILITIES OF THE SIGNIFICANCE OF THE DIFFERENCE BETWEEN EMPLOYER RATINGS	32

SECTION I
NATURE OF THE STUDY

Introduction

As stated in a handbook recently published by the South Carolina Department of Education, cooperative education is:

a program (method) of vocational education for persons who, through written cooperative agreements between the school and employers, receive instruction, including required academic courses and related vocational instruction by alternation of study in school with a job in any occupational field; but these two experiences must be planned and supervised by the school and employers so that each contributes to the student's education and to his or her employability (1981, pages 1-2).

The alternation of study in school with time on the job is most commonly accomplished on a half-day basis. Under this arrangement, a student spends half of each day in school and the other half is spent working at a job which is related to his or her vocational field of study. There are, however, other program structures which accomplish the alternation on a daily, weekly, or term basis.

The coordination of the program elements is the responsibility of a teacher coordinator who advises students, identifies training stations for them, teaches a class in school which is closely related to the students' experience on the job, develops training agreements, and evaluates learning which has occurred.

Endorsement of the cooperative education method is partially motivated by the belief that the combination of classroom instruction and

experience in the work-place increases the relevance of the training received. Since research in the area of learning theory has provided evidence that greater student gains occur when the training is meaningful and clearly tied to "real life" situations, this increased relevance should result in increased student learning. Further, it is widely known that wise career choice decisions are often difficult for adolescents. It is believed that the opportunity to explore the area of career choice through working in a related job, which is provided to those participating in cooperative education programs, is helpful to those attempting to make those decisions.

Background for the Study

South Carolina has practiced the cooperative method of education for many years. While used predominately in marketing and distributive education and business and office education, the method is also used to some extent in other program areas; and it is believed to be "the most effective vehicle to prepare students for gainful employment in all areas of vocational education" (South Carolina Department of Education, 1981, page 1). Until now, however, this belief has been mainly intuitive, and no attempt has been made to gather evidence as to the effectiveness with which the method is practiced. The project which is the subject of this report was undertaken to gather this evidence.

Objectives of the Study

The project was undertaken to meet the following objectives:

1. To conduct an extensive literature search in order to determine what is known about the effectiveness

of the cooperative education method in other states.

2. To obtain evidence as to the effectiveness of the cooperative education method in South Carolina.

Delimitations of the Study

In an attempt to avoid over-surveying, the project director was requested to use available data rather than a mail-out questionnaire to accomplish the second objective of the study. Therefore, the data used for this purpose are obtained from employer ratings which are gathered on a routine basis as part of the annual follow-up of vocational graduates. While these ratings are certainly applicable to the purpose of this project, they measure the accomplishment of only one of numerous student outcomes which serve as evidence of program effectiveness. No conclusions about the degree to which the other student outcomes are achieved in South Carolina can be drawn from analysis of this data. Furthermore, only sixty-three cooperative education students were represented in the employer survey returns. This is a very small sample, and prevents the results from being generalized beyond this group.

In spite of these problems, the analysis does, at least, represent a beginning in the formal evaluation of the use of the cooperative method in South Carolina. Interpreted cautiously and in conjunction with the evidence gathered in evaluations conducted in other states (presented in the review of the literature section), the information provided should prove useful to educational personnel interested in the initiation or expansion of the cooperative method.

Format of the Report

Section II of this report will present the information gathered in the review of the literature which was conducted to meet the first objective of this project. Section III will describe the methods and procedures used to accomplish project objective two (to obtain evidence as to the effectiveness of the cooperative education method in South Carolina). Section IV will present the data analysis and a summary of the findings. Finally, Section V will present conclusions and recommendations based on both the literature review and the analysis of the South Carolina data.

SECTION II

REVIEW OF RELATED LITERATURE

In order to meet objective one of the project, a literature review which spanned the years 1965 to the present was conducted. The primary source of the literature was the Educational Resources Information Center (ERIC), searched through the Research in Education Index under such identifiers as: cooperative education, cooperative programs, work experience programs, and evaluation--programs. Other sources were citations obtained through the bibliographic retrieval service of The National Center for Research in Vocational Education, and through bibliographies which were presented in the articles themselves.

With the exception of a few materials read to obtain an overview of the topic and to narrow the search field, all articles which were reviewed evaluated secondary cooperative programs on the basis of hard data. Materials which simply describe programs, present curriculum materials, approach the topic from a purely philosophic viewpoint, or deal with post-secondary programs were excluded.

Most of the evaluations which were reviewed used a comparison group design, with the comparison group(s) consisting of students who had not participated in any sort of work education program and/or students who had participated in work education programs other than cooperative education (i.e. drop-out prevention or various other work experience or work study programs). Other evaluations measured outcomes for a sample of students who had participated in cooperative education programs without the use of comparison groups. Findings from the evaluations centered

around the following general categories:

1. the career development of graduates;
2. employer ratings of job performance;
3. attitudes of students and employers toward the cooperative program;
4. the factors which are associated with successful cooperative education programs;
5. advantages and disadvantages of participation in a cooperative education program; and,
6. the cost-effectiveness of cooperative education programs.

The remainder of this section will present the findings related to each of these areas.

Career Development of Graduates

There appears to be general agreement that participating in a cooperative education program allows students to put into practice knowledge and skills learned in the classroom, to explore their area of career choice, and to obtain professional work experiences. These opportunities are felt to be valuable to the student in the area of career development. Several of the studies which were reviewed hypothesized that:

1. Participation in cooperative education would result in low unemployment rates for graduates.
2. Cooperative education graduates would secure full-time employment faster after graduation.
3. More cooperative education graduates would secure full-time employment in areas related to their field of study.

4. Cooperative education graduates would experience more job satisfaction.
5. Cooperative education graduates would earn higher wages than non-cooperative education graduates.
6. Cooperative education graduates would experience more job stability (i.e., would change jobs less often).

All but one of the studies which explored the first of these hypotheses tended to find evidence to support the idea that participants in cooperative education programs would experience low unemployment rates after graduation. The one study which did not support this hypothesis was a 1975 study conducted by Daniel Molnar, in which the effectiveness of cooperative programs in three states, Minnesota, North Carolina, and Ohio, was examined. In comparing unemployment rates among cooperative education graduates with rates among a comparison group of graduates who had not participated in cooperative programs, Molnar found no significant differences in the rates for the two groups. However, in an extensive study conducted by Morgan Lewis (1976), which also used this comparison group design, cooperative education students were shown to have slightly less short-term unemployment after leaving high school. Furthermore, in three other studies, which compared unemployment rates among cooperative graduates to national and state unemployment averages, evidence was found which was favorable to the cooperative programs. In an early study conducted in Michigan (Haines, 1967), the unemployment rate among cooperative education graduates was less than 1 percent ten months after graduation. This compares favorably to the 3.4 percent overall unemployment rate and the 7 percent rate

among others of the same age group, which was true in Michigan at the time of the study. Similarly, Robert Harris, in a 1974 study which evaluated cooperative programs in fifty-four schools in Indiana, found that the unemployment rate among cooperative education graduates was lower than both state and national averages for the age group. And more recently, F. G. Welch (1980) explored this question in a study involving programs in Pennsylvania. While the Welch study did not make a national comparison, he did find that in his study area there was a far lower unemployment rate among coop graduates than among others of the same age group.

Two of these same studies, Lewis (1976) and Molnar (1975), also found evidence to support the second hypothesis (that cooperative education students would tend to find full-time employment faster after graduation). Lewis found that coop students acquired suitable jobs within a shorter period of time after leaving high school, and attributed this, in part, to the fact that about one-half of the coop students stayed on with their employer after they graduated. The Molnar study also indicated that coop graduates found full-time employment faster than non-coop graduates, and the difference was significant at the .05 level.

Carmela Kingston, in a 1970 study comparing beginning office workers who had participated in cooperative office education programs with a comparison group of workers who had not participated, and James Slick, in a 1974 study of over 2000 vocational graduates, also found evidence to support this hypothesis. Kingston found a significant difference in favor of the cooperative office education graduates in the speed

of securing full-time office positions after graduation. Slick found that the cooperative students in his study had nearly twice the probability of securing full-time employment before the date of graduation. Furthermore, of those who did not obtain their first job before graduation, 50 percent were able to obtain their first job within a two week period, as compared to 24 percent of the non-coop students.

The third hypothesis was that cooperative education students would be more likely to secure employment in jobs related to their field of study. Lewis (1976) and Slick (1974) both found that the coop students were significantly more likely to obtain jobs which were the same or highly related to the occupational areas studied. Welch (1980) also compared the rate of placement for his sample of cooperative students to the rate for all vocational students in the state. He found that the related placement rate among the coop students was nearly twice that for all vocational graduates.

The area of concern in the fourth hypothesis, job satisfaction, was explored by Earnest Stormsdorfer (1973) in a study which compared cooperative and non-cooperative graduates in Ohio. He found that coop students were generally more content with their jobs, at least in the first several years following high school. Slick (1974) and Walsh (1976) also found that workers who had participated in cooperative programs tended to rank higher on job satisfaction measures. These findings are not supported by Kingston (1970), however, who found no significant differences between the two groups on this question.

Studies exploring the question concerning the earnings of graduates

of cooperative programs (hypothesis five) have tended to focus on two issues:

1. the wages earned in the first full-time job after graduation; and
2. the rate of wage increases received during employment on the first full-time job.

In the 1974 Slick study, coop graduates were shown to earn higher weekly wages than non-coop students. Walsh (1976) also found that coop students enjoyed a slight salary advantage over non-participating students. However, Lewis (1976) and Kingston (1970) found no difference between the beginning earnings commanded by coop and non-coop graduates. Kingston, however, did find evidence that coop students received salary increases more rapidly than non-coop students in their first full-time job; and five months after graduation from high school there was a significant difference in favor of the coop group in the weekly gross wages earned. This finding of more rapid salary increases was also reported by Molnar (1975).

While the weight of the evidence seems to support the first five hypotheses in the area of career development, results are more divided on the question concerning job stability (hypothesis six). Lewis (1976) and Slick (1974) found that during a two year period after graduation, coop graduates tended to change jobs less often than employees who had not participated in a coop program during high school. However, Walsh, in a 1976 comparison group study involving cooperative and non-cooperative graduates in fifty non-urban cities, Kingston (1970), and Molnar (1975) each found no significant differences between the groups in the number of job changes during the follow-up period.

In summary, it appears that there is much evidence to support the contention that participation in a cooperative education program is beneficial to the student in terms of career development, at least as it is measured by employment rate, length of time needed to secure full-time employment, rate of placement in training related jobs, job satisfaction, and earnings. The issue is divided on the job stability question, although two studies did find evidence favorable to cooperative education in this area. On the whole, many career development benefits do seem to accrue to cooperative education students.

Employer Ratings of Job Performance

One of the major goals of cooperative programs is to increase the "employability" of the student. If the method is effectively accomplishing this goal, employer ratings of workers who have participated in coop programs should reflect satisfaction with the job performance of these graduates. In general, this appears to be the case. In Kingston's 1970 study, supervisors were asked to rate employees in the following areas:

1. quantity of acceptable work,
2. quality of work,
3. initiative,
4. work attitude,
5. attitude toward others, and
6. over-all value.

The supervisors gave higher ratings to the cooperative education graduates in every area of job performance. Differences were significant at the .05 level for attitude toward work, attitude toward others,

and overall rating. The cooperative education students in Slick's 1974 study also received higher ratings than the non-coop students. Employers in this sample agreed that the coop students could work with less supervision, were more cooperative, and progressed faster on the job than did non-coop students. Lewis (1976) also found that employers rated coop students highly. In his study, supervisors viewed coop students as more dependable and as better workers than regular employees. Furthermore, coops were less likely to leave their jobs or be absent from work than regular employees. Harris (1974), using a somewhat unusual measure of job performance, had supervisors state the nature of a hypothetical letter of recommendation. More than three-quarters of the employees indicated that they would write a favorable to exceptionally favorable letter.

In summary, the evidence from these studies seems to indicate that cooperative programs do tend to increase the students' employability. Employees in all studies rated the coop students highly in job performance, and where comparisons were made, the results favored those who had participated in cooperative programs.

Attitudes Toward the Cooperative Program

A commonly used measure in the evaluations reviewed has been attitude of participants toward the program. Unanimously, the results have been favorable to the cooperative method.

Coop students have been shown to express more positive attitudes toward school and work than non-coop students (Walsh, 1976; and Lewis, 1976); to retain positive attitudes after graduation (Walsh, 1976); to feel more well prepared for their jobs than non-coop students

(Lewis, 1976; Welch, 1980); and to indicate that they would recommend the program to friends (Walsh, 1976; Welch, 1980; Harris, 1974).

Employers also tend to show positive attitudes toward the program. According to Lewis, coop programs tend to "offer many advantages to employers that tend to outweigh the disadvantages that some employers feel are associated with hiring coop students" (1976, page 7). The employers in Harris' (1974) study also tended to view the program favorably. A very high percentage, over 90 percent, indicated that the firm had benefited from participation and that they would continue to participate.

Cost Effectiveness

While it appears that cooperative education programs do offer benefits to participants, a relevant question is whether the benefits are adequate when viewed in relation to the cost of operation; and several studies have examined this question. There does not, however, appear to be a clear-cut answer.

Lewis (1976) concluded that cooperative programs were approximately \$210.00 per pupil more expensive to conduct than regular vocational programs, mainly because of the coordination function and the expense of the coordinators' salaries and travel expenses. He examined this higher program cost in relation to the after-graduation salaries earned by cooperative students. Because the coop students in his sample did not earn higher salaries, see page 10, he concluded that, viewed in strictly monetary terms, the coop programs were not cost effective.

There are, however, other studies which do not support this conclusion. Molnar (1975), for example, found that no clear-cut difference

existed in costs between coop and non-coop programs; while a strong relationship was found between student-teacher ratio and cost, regardless of the type of vocational education method used.

Furthermore, there is some debate as to whether it is appropriate to restrict the benefit side of this cost/benefit question to wages earned by graduates. Welch (1977) for example, points out that,

It is obvious that there are many benefits to students other than monetary benefits--such as a wise career choice, job satisfaction, school satisfaction, as well as a positive adjustment to the world of work. Employers benefit heavily in the area of recruiting future employees as well as becoming an integral part of the school system and receiving some direct returns for their tax dollars (page 53).

In a book entitled Foundations of Vocational Education, Evans (1971) contends that the use of cooperative programs can provide monetary benefits to the school since it can reduce the equipment costs of providing vocational education while insuring relevant, up-to-date training for the students. As he says,

Highly specialized equipment which may quickly become obsolete cannot be afforded in a typical school vocational program, but will be provided on the job because of production demands (page 197).

And yet another viewpoint on this cost/benefit question is presented by Jim Biddle in a recent issue of "Indiana Vocational Education Communique." He calculated the dollar return received by the state as a result of the wages paid to cooperative education students and concluded that the programs made a significant positive impact on the state's economy.

It appears that the verdict on the cost-effectiveness question is somewhat dependent on which outcomes are considered "benefits" of the program. If benefits are viewed strictly in terms of student wages, Lewis' study suggests that the program may not justify the extra

administrative costs. Others, however, contend either that the coop programs do not, in actuality, cost more (see Molnar, page 13) or that extra costs incurred in one area may be offset by savings in another (see Evans, page 14). Furthermore, if "benefits" are viewed broadly, (to include advantages of the program other than economic), all authors, including Lewis, agree that the advantages outweigh the cost of the program.

Success Components

Several of the studies reviewed attempted to identify factors which seemed to be highly related to a "successful" program, or one which effectively meets its intended goals. Some of the factors identified in these studies have been:

1. successful coordinators,
2. high quality work stations,
3. maximum integration of classwork and on-the-job training, and
4. advisory committees.

Coordinators. What is it that distinguishes a successful coordinator from one who is unsuccessful? The National Association of Secondary School Principals in 1973 studied cooperative programs across the nation and concluded that adequate training was imperative. They found that while most of the coordinators were knowledgeable in the vocational field for which they were responsible, they "differed widely in such regards as their ability to safeguard students from exploitation by employers or from working in unsafe or unpleasant working situations, in their management skills, and in their knowledge of vocational counseling techniques"

(page 8). Based on this finding, they recommended the establishment of an internship program for coordinators.

Findings from the 1976 Walsh study, however, indicate that coordinators' personality traits may be more important than their level of training. Of thirty coordinators interviewed in this study, the majority did not consider special training a major priority for doing a successful job. Considered to be more important was selection of coordinators with personalities which allow the coordinators to enjoy and be adept at meeting employers, speaking to the public, and arbitrating problems.

The degree to which coordinators were actively involved and their knowledge level were identified as important in Harris' 1974 study. He found that the number of coordinator visits and the coordinators' knowledge of the student were significantly related to the employers' belief that the firm had benefited from participation in the program.

While it would probably be impossible to isolate any one "most important" characteristic, it is clear that the coordinator is a crucial element in effective programs. As Evans (1971) states, "Everyone who has studied cooperative work education programs agrees that well-prepared and able coordinators are the key to successful program operation" (page 196).

High quality work stations. In the Walsh study (1976), the quality of the work stations to which students were assigned was identified as being important to successful programs. The participant outcomes in this study were better for students whose school jobs:

1. paid higher than average wages;
2. employed students for more than the average number of hours per week;

3. lasted longer than the average job; and
4. provided highly rated integration of classwork and on-the-job training.

The securing of high quality work stations does not appear to be an easy task. It is a time-consuming duty which requires much advance planning and attention to administrative details. Walsh (1976) found that if coordinators are employed one month before the fall term begins solely for the purpose of job development, they are able to fulfill this function far more efficiently than those who have to enroll students, develop jobs, and begin classes all at the same time.

In addition to the difficulties arising from a lack of time for adequate job development, the program structure adopted by most coop programs in the Walsh study seemed to hamper the development of an adequate number of work stations. The alternating work-education structure, which was used by the majority of these programs, calls for students to attend school in the mornings and work in the afternoons. However, they found indications that use of structures which paired students on jobs so that employees receive the equivalent of full-time employees might increase the number of job orders received from employees. Such structures pair students' in-school and work time on a daily, weekly, or term basis rather than on a half-day basis.

Maximum integration of classroom and on-the-job training. Careful synchronizing of classroom instruction and on-the-job training so that the two are highly related was identified as an important component of successful coop programs by both Cohen (1973) and Walsh (1976). In the Walsh study, programs which had highly rated integration of classroom instruction and on-the-job training had higher success outcomes in the

following categories:

1. job satisfaction of students,
2. student school satisfaction,
3. program helped decide student occupation,
4. overall student rating of programs,
5. the likelihood that students would recommend programs to friends,
6. attitudes toward programs, and
7. attitudes toward jobs.

Advisory committees. The importance of high quality advisory committees to successful coop programs was also discussed by Walsh. According to this report there was ample evidence to support the contention that active and involved advisory committees, both city-wide and for specific programs, enhanced the quality of cooperative education programs. In describing what is meant by an "active and involved" advisory committee, they stated that such a committee, composed of well-known or high-level business or industry representatives, would meet often and perform two major functions, listed in order of their importance:

1. employer relations and job development, and
2. curriculum development and revision.

Advantages and Disadvantages

It seems clear that participation in cooperative education offers advantages for students. As has been indicated in the fore-going discussion, students tend to benefit in skill training, career development, and in the development of positive attitudes toward school and work. In addition, there is some indication that participation offers advantages in the socialization process of the enrollees.

Middleton (1975) found that the program not only created job skills within the students, but helped them become more confident and self-directed.

Employers also gain advantages from participation. As pointed out by Lewis (1976) "Although coops entail higher costs for supervision (as might be expected due to the training nature of the coop experience), they are usually paid lower wages and receive fewer fringe benefits than regular employees. In addition, coops are less likely to leave their jobs or be absent from work. Participating in cooperative programs can also reduce employers' recruitment and screening costs" (page 7).

Another advantage of cooperative education, pointed out by Evans (1971), is its:

. . . quick adaptability to change in the labor market demands. By contrast, vocational education which is based on school operated laboratories can be quite out of tune with labor market demands, partly because most vocational teachers are prepared to offer instruction in only one relatively small family of occupations. If the teacher has tenure then the school has little flexibility in dropping an out-dated program. Since cooperative education uses instructors on the job, and since openings for training stations are closely related to opportunities for full-time employment of graduates, cooperative work education is quickly responsive to changes in the labor market. Moreover, training stations are more easily obtained in fields with the greater labor shortages. The coordinator is therefore more likely to use this station (pages 196-197).

So, cooperative education offers advantages not only to students and employers, but to the vocational education system itself; since it can potentially increase the system's capability for maintaining relevant, up-to-date training program. However, since there are very few issues which have no negative aspects, a question pertinent to this discussion is whether there are also disadvantages associated with the cooperative method of education. The question is a difficult one to answer, because

few of the articles reviewed addressed this issue.

Kingston's study (1970) indicated that one disadvantage to students was an inability to participate in the complete school program. In her sample, scheduling difficulties created by the half-day in school and half-day on-the-job format which was used by most programs allowed only 20 percent of the cooperative students to participate in extra-curricular school activities. Since engaging in out-of-class school activities is believed to be an important vehicle for the acquisition of social skills, an inability to do so could be a serious disadvantage for coop students.

However, Lewis (1976) did not find this to be a problem in his study. While the coop students in his sample did participate a little less in some activities, like interscholastic sports, they reported a great deal of participation in vocational clubs such as the Vocational-Industrial Clubs of America and the Future Business Leaders of America. Furthermore, coop students in many studies reported that dealing with co-workers and the public while at work was helpful in gaining social skills. This interaction may, therefore, compensate in part for any loss of social interaction in school activities.

For employers, higher training cost is often mentioned as a disadvantage, although there is some indication that these costs are offset by savings elsewhere (see Lewis' discussion on page 19). Some employers also feel that the necessity of regular meetings with coordinators takes time away from other important duties and that these visits are sometimes disrupting to the regular employees. An efficient coordinator can, however, hold these disruptions to a minimum. Furthermore, most participating employers seem to feel that these disadvantages, if present, are outweighed by benefits.

SECTION III
EFFECTIVENESS OF COOPERATIVE
EDUCATION IN SOUTH CAROLINA

The second objective of the project was "To obtain evidence as to the effectiveness of the cooperative education method in South Carolina." A description of the methods and procedures used to meet this objective will be presented in this section.

Methods and Procedures

As part of the annual follow-up of vocational education graduates, the Management Information Unit of the Office of Vocational Education surveys a random sample of graduates of vocational programs in the state. On this survey, former students are requested to provide the names and addresses of their present employer. The employers are then surveyed, and are asked to rate the quality of the training received by the student in each of the following areas:

1. technical knowledge,
2. work attitude,
3. work quality,
4. cooperation with management,
5. cooperation with co-workers,
6. customer relations (where applicable),
7. overall rating.

The rating scheme for each of these areas is a five point scale, with a rating of five indicating "very good", a rating of four indica-

ting "good", a rating of three indicating "neutral", a rating of two indicating "poor", and a rating of one indicating "very poor." In addition, the employers are asked to compare the former vocational students' job preparation to the preparation of other beginning employees. The rating scheme for this question is a three point scale with a rating of three indicating "individual is better prepared", a rating of two indicating "both are about the same", and a rating of one indicating "individual is less prepared." (A copy of the employer survey is included in Appendix A, page 39.)

Copies of the returned employer surveys were obtained from the Management Information Unit to be analyzed for the purposes of this project, and the employer ratings were coded for analysis. Also coded was descriptive information which included the students': 1) race, 2) sex, 3) program method (i.e. cooperative education or non-cooperative education), and 4) special student status. (Handicapped, economically disadvantaged, and limited English speaking students are assigned "special student" status.)

After all surveys were coded, a correlational analysis was performed to determine whether there were factors other than program method which were possibly influencing survey responses. The results indicated no relationship between race or sex of the students and employer ratings. However, there were significant relationships between the length of employment and employer ratings on seven of the eight rating factors. The high positive correlations between these factors indicated that as length of employment increased, employer ratings tended to become more positive. There was also a significant negative correlation

between employer ratings on factor eight (overall preparation for the job as compared to other beginning employees). This negative relationship indicated that students who were classified as special students tended to receive lower ratings on this factor. These correlations are presented in table 1.

TABLE 1
Correlations Between Student
Characteristics and Employer Ratings

	Student Characteristics											
	Race			Sex			Length of Employment			Special Student		
	Corr. ^a	N ^b	Significance ^c Level	Corr.	N	Significance Level	Corr.	N	Significance Level	Corr.	N	Significance Level
1-Technical knowledge	.040	339	.46	.027	340	.62	.242	327	.0001*	.054	340	.32
2-Work attitude	-.012	345	.82	.011	346	.83	.261	333	.0001*	.034	340	.53
3-Work quality	-.028	344	.60	-.007	345	.89	.276	332	.0001*	-.026	345	.63
4-Cooperation w/management	-.040	345	.46	.013	346	.81	.227	333	.0001*	-.010	346	.85
5-Cooperation w/co-workers	.008	342	.88	-.017	343	.75	.215	330	.0001*	-.035	343	.51
6-Customer relations (where applicable)	.063	260	.31	.040	261	.52	.143	252	.024*	.098	261	.11
7-Overall rating	-.048	339	.38	.092	340	.09	.195	328	.0004*	.016	340	.78
8-Job preparation	-.093	238	.15	-.075	238	.25	.102	231	.121	-.128	238	.05

NOTES: ^aCorrelation coefficient

^bNumber included in the analysis

^cUsing the correlation between race and rating on technical knowledge as an example, the significance level is to be read, "A correlation as high will occur by chance forty-six times out of one hundred."

*Indicates correlations at or below the .05 level.

N's vary because some surveys had no responses on questions from which the correlations were calculated.

Since the research design called for comparing employer ratings of the non-cooperative education students (control group) and the cooperative education students (experimental group), it was necessary to control for the possible influence of these factors other than educational

program method which were significantly correlated with the employer ratings. In order to accomplish this, a matched pairs design was employed in forming the two groups. With the exception of six cooperative education students who, because of non-response, could not be classified as to length of employment, all cooperative education students were included in the experimental group (fifty-seven of sixty-three). The control group was formed by randomly drawing a match for each member of the experimental group from among the 284 non-cooperative education students. Since the pairs were matched on the basis of length of employment and special student status, the two groups are alike with respect to these factors. Therefore, any differences in the ratings received by the two groups can more confidently be attributed to the educational program method. Readers should bear in mind, however, that it was only possible to control for extraneous variables which were identifiable from the data available on the surveys. Therefore, it is possible that still other factors are influencing the results, and interpretations should be made cautiously.

SECTION IV

FINDINGS

Data Analysis

In order to gather evidence as to the effectiveness with which cooperative education is operating in South Carolina (project objective two), three types of data analysis were performed: frequency distributions were calculated for each of the descriptive variables (i.e. race, sex, ect.) and for each of the eight employer ratings; an average rating (mean) was calculated for each of the eight employer ratings; and a t-test analysis was performed in order to determine the significance of the difference between the mean ratings for the experimental and control groups.

Summary of Findings

Description of groups. Each of the two groups, those students who had participated in cooperative education in high school (hereafter referred to as the coop group) and those students who had not participated in cooperative education in high school (hereafter referred to as the non-coop group), is made up of fifty-seven students. Because of the matching procedure employed (see page 23), there are equal proportions in the two groups of students who fit each of the length-of-employment categories (i.e. less than three months, three to six months, and six to twelve months), and of students classified as special

students (see page 22 for description). The two groups are also quite similar with respect to the proportion of students from each race and sex category, with the majority in each group consisting of white females. Complete information as to this descriptive data is presented in table 2.

TABLE 2
Race, Sex, Length of Employment,
and Special Student Status, By Group

Group	Descriptive Factors																	
	Race				Sex				Special Student				Length of Employment					
	W		B		M		F		Yes		No		<3 ^c		3-6		6-12	
	# ^a	% ^b	#	%	#	%	#	%	#	%	#	%	#	%	#	%	#	%
Coop N=57	43	75	14	25	15	26	42	74	11	19	46	53	9	16	7	12	41	72
Non-Coop N=57	43	76	13	23	17	30	40	70	11	19	46	53	9	16	7	12	41	72

NOTES: ^aFigures in the column headed by "#" represent the number of students in the category.

^bFigures in the column headed by "%" represent the percentage of students in the category.

^cThe symbol "<" means "less than."

Totals not adding to N are due to non-response.

Percentages not adding to 100 are due to rounding.

Length of employment is expressed in months.

Employer ratings. Examination of the results of the frequency distributions for employer ratings reveals that a large majority of the employers of both coop and non-coop graduates consider them good or very good in all rated areas. In technical knowledge, work attitude, work

quality, cooperation with management and cooperation with co-workers the non-coop graduates received ratings of "very good" slightly more frequently. (In no case was the difference greater than two percent.) In the overall rating, the difference, still in favor of the non-coop group, was larger. Ten percent more of the non-coop students received a rating of "very good" than did the coop group on this factor. However, when the frequencies for "very good" and "good" ratings are combined, the advantage switches to the coop group. On all factors except "cooperation with co-workers" (where the two groups were equal), the coop students received ratings of "good" to "very good" more frequently, and the difference between the groups was more pronounced. This difference ranged from a low of two percent in favor of the coop group on the "comparison with other workers" factor to ten percent on "work quality." Furthermore, the non-coop workers were slightly more frequently rated in the "poor" or "very poor" category on most factors.

Complete information regarding these ratings is presented in tables 3 and 4.

TABLE 3
Employer Ratings of Job Performance, By Group

Rating Factor	Group			
	Coop		Non-coop	
	Number	Percent	Number	Percent
<u>Technical Knowledge</u>				
Very Good	13	24	14	26
Good	31	56	28	51
Neutral	9	16	11	20
Poor	2	4	3	5
Very Poor	--	--	--	--
No Response	2	na	1	na

TABLE 3--Continued
Employer Ratings of Job Performance, By Group

Rating Factor	Group			
	Coop		Non-coop	
	Number	Percent	Number	Percent
<u>Work Attitude</u>				
Very Good	28	91 ⁴⁹	27	78 ⁴⁸
Good	24	42	17	30
Neutral	5	9	10	18
Poor	--	--	2	4
Very Poor	--	--	--	--
No Response	--	na	1	na
<u>Work Quality</u>				
Very Good	24	88 ⁴³	25	77 ⁴⁵
Good	25	45	18	32
Neutral	6	11	11	20
Poor	1	2	2	4
Very Poor	--	--	--	--
No Response	1	na	1	na
<u>Cooperation With Management</u>				
Very Good	31	98 ⁵⁴	31	93 ⁵⁵
Good	25	44	21	38
Neutral	1	2	3	2
Poor	--	--	1	2
Very Poor	--	--	--	--
No Response	--	na	1	na
<u>Cooperation With Co-Workers</u>				
Very Good	33	93 ⁵⁸	32	93 ⁵⁷
Good	20	35	20	36
Neutral	3	5	2	4
Poor	1	2	1	2
Very Poor	--	--	1	2
No Response	--	na	1	na
<u>Customer Relations (Where Applicable)</u>				
Very Good	21	94 ⁴⁶	17	90 ⁴¹
Good	22	48	20	49

TABLE 3--Continued
Employer Ratings of Job Performance, By Group

Rating Factor	Group			
	Coop		Non-coop	
	Number	Percent	Number	Percent
Neutral	3	7	4	10
Poor	--	--	--	--
Very Poor	--	--	--	--
No Response	11	na	16	na
<u>Overall Rating</u>				
Very Good	18	87 ³³	25	81 ⁴⁴
Good	29	54	21	37
Neutral	6	11	11	19
Poor	1	2	--	--
Very Poor	--	--	--	--
No Response	3	na	--	na

NOTES: Total percentages may not add to 100 due to rounding.

Subjects in the "no response" category are not included in the calculation of percentages.

^a Indicates "not applicable."

TABLE 4
Responses to Question: "As a result of this person's vocational training, how would you rate his or her preparation in relation to other beginning employees who did not receive such training?", by Group

Rating	Group			
	Coop		Non-Coop	
	Number	Percent	Number	Percent
Better Prepared	30	79	30	77
Both About the Same	8	21	7	18
Less Prepared	--	--	2	5
No Response	19	--	18	--

NOTES: Base for percentages does not include non-responses.

Average Ratings

The second analysis performed was the calculation of means (arithmetic averages) and standard deviations for each rating factor, by group. This analysis provides an indication of how workers from each group are rated on the average. In order to accomplish this, each rating category was assigned a numeric value. (See pages 21-22 for delineation of these values.)

The results of this analysis indicate that on all but two rating factors, the coop group received a slightly higher rating on the average. On customer relations and the overall rating, the non-coop group obtained a slightly higher mean.

The standard deviation is a measure of the degree to which scores in the distribution tend to vary from the mean. A very small standard deviation indicates that the scores in the distribution tend to "bunch up" around the average score, while a large standard deviation indicates a wide range in the score distribution, with some scores much higher and/or lower than the mean. The standard deviations for all of the mean ratings are quite small. This indicates that most of the ratings tend to fall close to the mean in both groups. The means and standard deviations for all rating categories are displayed in table 5.

T-Test Analysis

Finally, a t-test analysis was performed in order to determine whether the differences between the mean ratings in the two groups were statistically significant. This analysis indicates that none of the differences are significant at the .05 level. The t values and significance levels are presented in table 6.

TABLE 5
Mean Employer Ratings of Job Performance, By Group

Rating Factor	Group					
	Coop			Non-Coop		
	Mean	SD ¹	N ²	Mean	SD	N
Technical Knowledge	4.00	.75	55	3.95	.82	56
Work Attitude	4.40	.75	57	4.23	.87	56
Work Quality	4.29	.73	56	4.18	.88	56
Cooperation With Management	4.23	.54	57	4.46	.69	56
Cooperation With Co-Workers	4.49	.68	57	4.45	.81	56
Customer Relations (Where Applicable)	4.39	.61	46	4.32	.65	41
Overall Rating	4.19	.70	54	4.25	.76	57
Comparison w/Other Beginning Employees	3.79	.41	38	3.72	.56	39

NOTES: ¹Figures in this column indicate the standard deviation.

²Figures in this column indicate the number of students included in the analysis. N's less than fifty-seven are due to non-response.

SECTION V

CONCLUSIONS AND RECOMMENDATIONS

The purpose of the project was to obtain information about the effectiveness of the cooperative education method through an examination of evaluations conducted in other states and an analysis of data gathered in South Carolina. In this section, conclusions drawn from the findings of the study and recommendations based on these conclusions are presented.

Conclusions:

The evaluations conducted in other states, (see Section II, pages 6 - 13) provide evidence to support the conclusion that participation in cooperative education programs can provide many benefits to vocational students. Coop graduates have been shown to:

1. have less unemployment after graduation than non-coop graduates;
2. find full-time employment faster after graduation;
3. secure full-time jobs which are related to the field of study more often;
4. feel more satisfied with their jobs after graduation;
5. receive wage increases more frequently in the first full-time job after graduation;
6. receive higher ratings from employers on measures of work performance; and,
7. have positive attitudes about the cooperative program.

Evidence has also been found to indicate that employers who participate in coop programs feel that the method is helpful and that participation is beneficial to the participating business as well as to the students (see Section II, pages 14 and 19).

The one effectiveness outcome measured for South Carolina coop programs does not indicate that the participating students received significantly higher employer ratings than did the non-coop students. The ratings for both groups were, however, quite high and the indication from the South Carolina data is that the coop programs and the regular vocational programs are doing an excellent job of training students. (See Section III, pages 21-32.)

Studies which have examined cooperative education from a cost-effectiveness viewpoint tend to indicate either that the coop programs are no more expensive than the regular vocational programs and offer more advantages to graduates, or that the coop programs are somewhat more costly to operate but offer benefits which outweigh the added expense. (See Section II, pages 13-14.)

Studies which have examined the factors which are related to highly successful coop programs indicate that the most effective programs:

1. have coordinators who are well trained, who are adept at meeting employers, speaking to the public, and arbitrating problems, and who are actively involved in the program;
2. have maximum integration of classwork and on-the-job training;
3. secure high quality training stations for students; and,
4. have active and involved advisory committees.

(See Section II, pages 15-18.)

There is some indication that coop programs which have teacher-coordinators who begin working one month before the beginning of the fall term and which use program structures other than the half-day alternation have less difficulty obtaining training stations for students. (See Section II, page 17.)

Recommendations:

Local education agencies currently employing the cooperative method should continue to do so. Those not using the method, or using it to a limited degree, should consider adding cooperative education to program offerings or increasing the number of program areas which use the method.

Local education agencies implementing new cooperative education programs should insure inclusion of those factors which have been identified as important to effective use of the method. Those currently using the method should examine administrative practices to insure that all of these factors are present.

Coop programs having difficulty obtaining training stations should consider:

1. hiring teacher-coordinators on a ten month basis; and/or,
2. using a program structure other than the half-day alternation.

Reading materials which are recommended for those interested in implementing new cooperative education programs are referenced and briefly described in Appendix B, page 41.

APPENDIX A

**STATE DEPARTMENT OF EDUCATION
OFFICE OF VOCATIONAL EDUCATION
EMPLOYER FOLLOW-UP FORM**

Please answer the following questions in reference to the employee whose name appears on the name label above.
This student completed a vocational program in _____

1. How long has this person been a full-time employee with your company? (Check one)

- A. Fewer than 3 months _____
B. 3 to 6 months _____
C. 6 to 12 months _____

2. Please rate the vocational training received by the individual in the following areas:

	Very Good	Good	Neutral	Poor	Very Poor
a. Technical knowledge	5	4	3	2	1
b. Work attitude	5	4	3	2	1
c. Work quality	5	4	3	2	1
d. Cooperation with management	5	4	3	2	1
e. Cooperation with co-workers	5	4	3	2	1
f. Customer relations (where applicable)	5	4	3	2	1

3. What is your overall rating of the vocational training received by this individual as it relates to the requirements of his or her job?

- A. Very Good _____ B. Good _____ C. Neutral _____ D. Poor _____ E. Very Poor _____

4. As a result of this person's vocational training, how would you rate his or her preparation in relation to other beginning employees who did not receive such training?

- A. _____ No basis for comparison C. _____ Both are about the same
B. _____ Individual is better prepared D. _____ Individual is less prepared

5. Does anyone at your company contact the local high schools or vocational centers to make job openings known to high school students on a regular basis?

- A. _____ YES B. _____ NO

6. What suggestions do you have for improving the technical and/or personal skills of vocational education students who will be employed by your firm? (Example: Writing a report, coping with stress, use of metric system, etc.)

Please use the back of the page to write whatever response you wish.

Federally required questions on this survey are numbers 2a, 2b, 2c, 3 and 4

APPENDIX B

The following reading materials, which are briefly described, are recommended for those interested in implementing new cooperative education programs.

North Dakota State Board for Vocational Education. Cooperative Education. North Dakota University, Grand Forks, North Dakota: August, 1980. ERIC #ED 195 749.

This reference is described as a guidebook designed to assist school administrators and teacher-coordinators in planning for cooperative education programs. Major section titles included are: Definition, Types of School Plans, Benefits of Cooperative Education, Role of Teacher-Coordinator, Program Planning and Development, Advisory Committees, Surveys, Scheduling Options for Cooperative Education, Teaching, Coordination Activities, Forms and Agreements, Evaluation, Public Relations, The Role of the Administrator, The Role of the Guidance Counselor, Child Labor Laws. Also included is a list of references in the area of cooperative education.

South Carolina Department of Education. Cooperative Vocational Education. May, 1981.

This book provides basic guidelines and presents legal principles which will help local school districts plan and implement cooperative education programs. Major section titles include: Introduction, Organization of Cooperative Programs, Implementation of Cooperative Programs, Evaluation of Cooperative Programs, Legal Aspects of Cooperative Programs, Teacher-Coordinator Activities in Cooperative Programs, and Teacher-Coordinator Accountability. A variety of sample materials is included in an appendix.

Worley, Tom. Cooperative Education Coordinator's Handbook, Oklahoma State Board of Vocational and Technical Education. Stillwater: 1980, 142 p. ERIC #194 736.

This book is also intended to be a guidebook for coordinators and administrators. Described as a performance-oriented desk reference, the book overviews cooperation education; contrasts types of programs; provides guidelines for the establishment of programs; identifies the unique characteristics for various types of cooperative education programs by program area; discusses the teacher-coordinator role; describes characteristics of training stations/sponsors; and discusses the make-up and function of advisory committees. Extensive sample materials are presented in the appendixes.

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